Name: Date:

Polynomial Factoring solution (version 49)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 8x + 34 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(8) \pm \sqrt{(8)^2 - 4(1)(34)}}{2(1)}$$

$$x = \frac{-(8) \pm \sqrt{64 - 136}}{2(1)}$$

$$x = \frac{-8 \pm \sqrt{-72}}{2}$$

$$x = \frac{-8 \pm \sqrt{-36 \cdot 2}}{2}$$

$$x = \frac{-8 \pm 6\sqrt{2}\, i}{2}$$

$$x = -4 \pm 3\sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-5 + 4i$ and $-3 - 2i$ in standard form $(a + bi)$.**

Solution

$$(-5 + 4i) \cdot (-3 - 2i)$$

$$15 + 10i - 12i - 8i^2$$

$$15 + 10i - 12i + 8$$

$$15 + 8 + 10i - 12i$$

$$23 - 2i$$

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3. **Write function $f(x) = x^3 - 10x^2 + 27x - 18$ in factored form. I'll give you a hint: one factor is $(x - 6)$.**

Solution

	1	-10	27	-18
6		6	-24	18
	1	-4	3	0

$$f(x) = (x-6)(x^2 - 4x + 3)$$

$$f(x) = (x-6)(x-1)(x-3)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+2)^2 \cdot (x-1) \cdot (x-4)^2$$

Sketch a graph of polynomial $y = p(x)$.